An Approach to Estimate Regulatory Performance

Kemal Huseinovic, Mirko Skrbic, Zlatko Lagumdzija
Communications Regulatory Agency, Faculty of Electrical Engineering, Faculty of Economy - University of Sarajevo
Bosnia and Herzegovina
khuseinovic@rak.ba, mirko.skrbic@etf.unsa.ba, zlatko.lagumdzija@efsa.unsa.ba

***Abstract*—In order to follow the trends imposed by globalization, the regulation should be based on technological neutrality and market orientation. The aim is to protect the interests of users, strengthen the competition, support involvement of new participants on the market and exert positive influence on the economic growth. Technological convergence enables all types of networks to provide almost any service, thus imposing the need for the regulation to follow the same trend. In order to minimize the differences among communication market beneficiaries, it is necessary to harmonize the communication market legislative framework among countries. In our view, the most efficient harmonization is achieved with support from convergent regulatory authorities of the communications market. The regulatory performance is measured using statistical techniques on data obtained from interviewing relevant European institutions and authorities.**

Keywords - Regulation; Organization; Competition

I. INTRODUCTION

In the world of increased global competitiveness, where the competitors are no longer limited only to the local market, the countries can no longer risk losing the opportunities and advantages brought on by the convergence of markets, technologies and services for the sake of artificial barriers of their regulatory frameworks.

These regulatory frameworks were set up at a time before the strong and aggressive wave of convergence struck all forms and spheres of the communications market. Consequently, one must come to a conclusion that they were not designed for this era of overall convergence.

In order to follow the trends imposed by globalization, regulation should be based on technological neutrality and market orientation,. This is all aimed at protecting the interests of users, strengthening competition, supporting involvement of new participants on the market and exerting positive influence on the economic growth.

Technological convergence enables all types of networks to provide almost any service, thus imposing the need for the regulation to follow the same trend..In such a situation, it would be almost impossible to have fair market services in different types of networks, where the subjects have different sets of regulatory rules and are under the jurisdiction of different regulatory authorities.

In case of separated regulatory authorities for telecommunications and media, there is a potential danger of the so called regulatory uncertainty (EC [6]). That is a situation when one service provider (e.g. «triple play») has to obtain a work permit from both regulatory authorities, which makes the process of its marker entry more complex, longer and more expensive. Quite frequently, but not necessarily, their market approach rests upon the concept of one bill per one user. One bill containing costs of transfer of data, voice, television and video presents a significant saving for the user. With a higher number of services included, the price of individual service in the package usually decreases. Somewhere, nevertheless, all obstacles have been removed and the operators may freely offer their type of television subscription.

As well as big media houses, the cable and telephone operators have shown significant interest in technology, creating the opportunity for the transmission of all three media through one network. Their goal is to seize upon the market potential offered by the service and to maintain the existing subscribers of the basic telecommunication services. In order to minimize the differences among the communication market beneficiaries, it is necessary to harmonize the communication market legislative framework among countries. The most efficient harmonization is achieved with support from convergent regulatory authorities of the communications market. The convergent has been present in Bosnia and Herzegovina since 2003.

This paper includes a clearly stated research goal followed by the description of the statistical techniques and interview design. It finishes with results confirming the organization of operators in Bosnia and Herzegovina.

II. THE RESEARCH FRAMEWORK

The conducted research proved the following hypotheses:
(1) the convergent form of communication market regulatory authorities improves the country's competitiveness;
(2) convergent rather than separate regulatory authorities are a more appropriate model for ensuring development of the communication market on the territory of a country;
(3) organizational form affects the ability of a regulator to implement European directives in the telecommunications sector.

 ISBN: 978-1-61208-166-3

The importance of research is established from the need to implement the standardization of regulatory practices on the international level and the influence of the practices on the competitiveness of national economies on a global scale.

It is quite clear why competitiveness has become one of the main preoccupations of governments and industries of almost every nation in the world (Porter [19]).

Development strategies of modern countries, this way or the other, are basically measured by the economies' achieved degree of competitiveness. According to the definition presented by the USA Economic Advisory Board, which was in a later stage accepted within the European Union, competitiveness in its essence has a goal to improve the living standard (Michalis [18]).

M. Porter [19] claims that the only importance of the concept of competitiveness at the national level is national productivity. The living standard progression depends on the capacity of national companies to achieve a high level of productivity and to increase this productivity in time (Porter [19]). Due to all-present information in the value chain, a fast change in ICT has an enormous influence on the competitive advantage and competitiveness (Porter [19]). New related technologies and are being taken as the main resource and a good indicator for global competitiveness (Castells [4]).

There are numerous models of measuring competitiveness in the world some of which include: Global Competitiveness Index – GCI, Network Readiness Index – NRI, ICT Development Index- IDI, etc.

The trend of convergence of regulation is also a form of accelerated and forced standardization. Namely, each country, particularly those in transition, are witnessing the integration of the communication sector and broadcasting, together with forced stimulation of modernization of these spheres at the level of the regions within the country itself. The optimal model of organization of regulatory authorities stimulates internationalization of standards, local development of these sectors, maximal degree of development of competition on the communication market, promotes foreign investments and, triggers the growth of living standard of citizens.

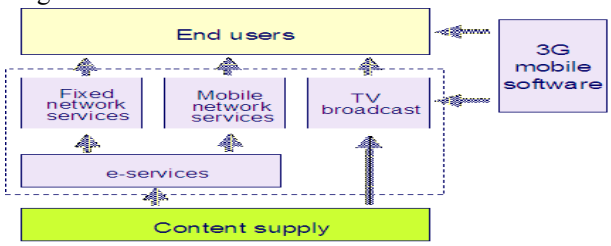

Figure l. Trend of convergence of telecommunication and broadcasting services

The model of a „convergent regulator" is being imposed as an optimal organizational structure from the point of view of convergence of technology and stimulation of technological and communication market development. The technological analysts have been stating for quite some time that all forms of electronic communications will merge into one.

In this view, radio and television broadcasters and telecom operators will extensively keep entering into each others' markets, directing them towards convergent approach to market/consumers (joint service packages), with a tendency towards the so called "free" services, so that costs of these services get redirected to advertisers and direct marketing clients.

III. The Methodology

Both primary and secondary data sources were used for the paper design. The following competitiveness models and indicators were applied: Global Competitiveness Index – GCI, Network Readiness Index – NRI and ICT Development Index- IDI.

The research of regulatory authorities in Europe was conducted on a sample of 79 regulators, based on the designed survey, close-end questions. Responses from 61 regulatory authorities, or 77% of the total number of respondents, have been obtained. Out of this number, responses were obtained from 8 convergent regulators, 27 media regulators and 26 telecommunication regulators. The methods of response collection included electronic mail, direct contacts of authors with the officials of other regulators on international gatherings, and by fax. During the design of survey questions, the system of Likert scale was used, with offered responses rated from 1 to 5 (Kukić and Markić [15]). The survey questions have examined the regulatory bodies' stances on the influence of a convergent regulator onto the quality of technological neutrality implementation and effects exerted by the regulatory authorities on the telecommunication and broadcasting development. In order to analyze the data, the structural analysis and descriptive statistics were used together with the application of „chi square" and „t" tests. The data was processed using the software package „Excel" and statistical package SPSS14, and the results were presented in tables and figures. Options of testing and descriptive statistics were used at the same time to examine the significance of the sample interval, as well as deduction on the basis of the achieved results.

The interview was also conducted on a sample of 51 experts in the fields of telecommunication, broadcasting and regulation services. The designed survey questions were related to organizational form of a regulator and its capacity to implement the European directives.

IV. The Results

USA and Canada have had combined regulatory agencies for telecommunication and broadcasting for decades. Within the last fifteen years, some other countries have started to establish single, merged regulatory authorities that regulate both broadcasting and telecommunication segments. In the recent years, a noticeable progressive trend in the number of convergent regulatory agencies has been present. It is

 ISBN: 978-1-61208-166-3

obvious that more and more countries have decided to choose this institutional form of the state regulatory authorities whose jurisdiction covers regulation of all forms of communication technologies, including both the broadcasting and telecommunications sectors.

It is more cost effective for countries to finance and maintain the work of one agency instead of several regulatory authorities.

The new regulatory framework of European Union provides for regulatory treatment of service convergence. The framework introduces the notion of "electronic communication services" instead of the previously used "telecommunication services + broadcasting services", pointing to a clear signal of convergent regulatory approach to a wider spectrum of communication services. Italy was the first country in Europe that has established convergent regulatory authorities for communications. It was followed by Finland, Bosnia and Herzegovina, Slovenia, Switzerland, and others. Following the introduction of the new EU framework, Great Britain responded by forming a convergent communication regulator in 2003, which replaced the previous five separate regulatory authorities in charge of telecommunication, radio-frequency spectrum and broadcasting.

Malaysia has had a convergent regulation in force since 1999, introducing a regulatory framework exclusively designed to adjust to the phenomenon of convergence. Malaysian convergent regulator (Malaysian Commission for Multimedia and Communications (MCMC) was among the first in the world to introduce a technologically and service-wide neutral system of issuing permits. Singapore was also one of the first in Asia who chose a convergent model of regulatory authorities. Brazil was the first in South America to introduce a convergent regulator (ANATEL), as early as in 2001. In Africa, it was South Africa that established a convergent regulation (ICASA) in 2000. During the last decade some of the developing countries have also established convergent regulators (ITU [11]).

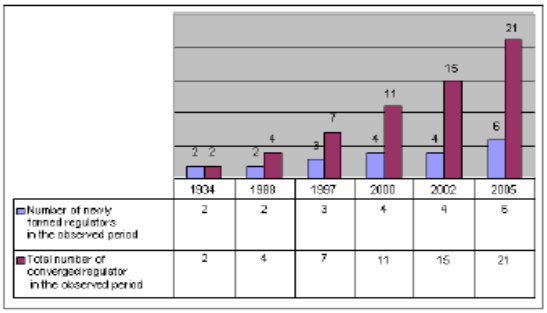

Figure 2. The formation trend and growth in the number of convergent regulators

The following results are based on the analysis of positions of the countries which have introduced a convergent form of communication market regulatory authorities from the aspect of different measures of competitiveness: Global Competitiveness Index – GCI, Network Readiness Index – NRI, ICT Development Index-IDI.

Table 1 presents the position of the countries with a convergent regulator against GCI index in the period 2004-2009 - the ranking list of countries with convergent regulators according to GCI, sources: [5] and [16] p. 13). According to the ITU research, there are 254 regulatory bodies in the world, with 21 countries, or less than 8% of the total number of countries, having a convergent form of regulatory authorities, According to GCI, on the top-ten list of countries in the world in the last five years, there are seven countries, or 70%, with a convergent form of regulatory authorities. Consequently, 8% of countries with a convergent regulator participate with 70% among the top ten ranked countries according to GCI.

This significant piece of data opens some dilemmas and raises a number of questions. Is the high ranking of countries, according to GCI index, the result, among other things, of their decision to choose a convergent form of a regulator? The fact that seven out of ten countries with most competitive economies in the world chose a convergent regulation may indicate that this is a trend to be followed. It can be stated that this analysis adds value to the claim that a convergent form of regulatory authorities has a positive impact on the development of a communication market and increases the level of competitiveness of a country.

TABLE I. THE RANKING OF CONVERGENT REGULATORS

Country / Economy	GCI 2004-2005	GCI 2005-2006	GCI 2006-2007	GCI 2007-2008	GCI 2008-2009
USA	2	1	1	1	1
Switzerland	8	4	4	2	2
Singapore	7	5	8	7	5
Finland	1	2	6	6	6
Germany	13	6	7	5	7
Japan	9	10	5	8	9
Canada	15	13	12	13	10
United Kingdom	11	9	2	9	12
South Korea	29	19	23	11	13
Austria	17	15	18	15	14
Australia	14	18	16	19	18
Malaysia	31	25	19	21	21
China	46	48	54	34	30
Slovenia	33	30	40	39	41
South Africa	41	40	36	44	44
Italy	47	38	47	46	48
Brazil	57	57	66	72	63
BiH	81	88	82	106	105
Tanzania	82	105	97	104	110
Malawi	87	114	117	n/a	n/a
Iraq	n/a	n/a	n/a	n/a	n/a

Table 2 presents global rankings of countries in the period 2005-2009 according to NRI index [5]. Among the top twenty countries in the last five years according to NRI index, there are twelve that have a convergent form of regulatory authorities, which makes 60% of the countries taking up the top-twenty positions.

 ISBN: 978-1-61208-166-3

TABLE II. RANKINGS ACCORDING TO NRI INDEX

Country/Economy	NRI 2005-2006	NRI 2006-2007	NRI 2007-2008	NRI 2008-2009
USA	1	7	4	3
Switzerland	2	3	5	4
Singapore	9	5	3	5
Finland	5	4	6	6
Germany	6	11	13	10
Japan	14	19	9	11
Canada	7	13	11	12
United Kingdom	15	15	14	14
South Korea	9	10	12	15
Austria	18	17	15	16
Australia	16	14	19	17
Malaysia	17	16	16	20
China	24	26	26	28
Slovenia	35	30	30	31
South Africa	42	38	42	45
Italy	37	47	51	52
Brazil	52	53	59	59
BiH	97	89	95	106
Tanzania	n/a	111	n/a	110
Malawi	84	91	100	119
Iraq	n/a	n/a	n/a	n/a

Having in mind that the NRI index rests upon three assumptions – environment, readiness and ICT use, it is obvious that well-developed countries which have enabled the convergence, have a stimulating regulatory framework of communication technologies which enhances the influence of ITC on economic development together with the level of development of the communication market. This information can also serve as contribution to the statement that a convergent form of regulatory authorities has a positive impact on competitiveness.

Table 3 presents the global rankings of countries in 2002 and 2007 according to the IDI index. It is evident that, out of the twenty highest ranked countries according to this index, twelve of these, or 60% have a convergent form of regulator. Therefore, according to the analysis of results of a relevant research conducted by the World Economic Forum and the International Telecommunication Union [5] [10], it can be stated that, among the top twenty countries in the world in terms of competitiveness, over 50% of the countries have convergent regulators.

These results contribute to proving a part of the main hypothesis, that a convergent regulatory authority is optimal from the point of view of achieving a maximal degree of the communication market development, protection of users and raising the level of competitiveness of a country. Most regulators also believe that a convergent rather than a separate organizational form of regulatory bodies has a positive influence on the development of telecommunication and broadcasting fields. What is significant is that although less than 10% of the countries in the world have convergent regulatory authorities, these countries are extremely highly ranked on all competitiveness measuring scales.

TABLE III: THE RANKING ACCORDING IDI INDEX

Country/Economy	Rank 2007	IDI 2007	Rank 2002	IDI 2002
South Korea	2	7.26	3	5.83
Switzerland	8	6.94	7	5.42
Finland	9	6.79	8	5.38
United Kingdom	10	6.78	10	5.27
China	11	6.70	12	5.10
Japan	12	6.64	18	4.82
Germany	13	6.61	14	5.02
Australia	14	6.58	13	5.02
Singapore	15	6.57	16	4.83
USA	17	6.44	11	5.25
Canada	19	6.34	9	5.33
Austria	20	6.32	20	4.64
Italy	22	6.18	24	4.38
Slovenia	28	5.88	22	4.47
Malaysia	52	3.79	50	2.74
BiH	58	3.54	66	2.33
Brazil	60	3.48	54	2.55
South Africa	87	2.70	77	2.11
Malawi	141	1.17	141	0.95
Tanzania	145	1.13	138	0.96
Iraq	n/a	n/a	n/a	n/a

Convergence of infrastructure based on the next generation of networks provides for access to a wide spectrum of services, requires convergence of regulation and, presents the optimal option from the perspective of the end user. In order to analyze and prove this auxiliary hypothesis we used an interview of regulatory authorities.

Table 4 presents the attitudes of the European regulatory bodies based on the question whether a convergent form of regulators provides a better quality implementation of the principle of technological neutrality in regulatory processes than separate regulatory authorities. A positive reply to this statement has been provided by 34 respondents, or 56% of the overall respondents. Eleven, or 18% of respondents, provided a neutral reply. Sixteen respondents, or 26% of them, expressed their disagreement with this statement, with only three respondents who fully disagreed with it.

Figure 3 provides a graphic structure of the expressed attitudes of regulatory authorities in percentage.

TABLE IV : THE INFLUENCE ON NEUTRALITY

Convergent regulator ensures better quality implementation of principle of technological neutrality in regulatory processes than separate regulatory authorities.	Convergent regulators	Regulators for telecommunications	Regulators for media	Total number of regulators
1	3	4	5	12
2	4	11	7	22
3	1	6	4	11
4	0	3	10	13
5	0	2	1	3
Total	8	26	27	61

 ISBN: 978-1-61208-166-3

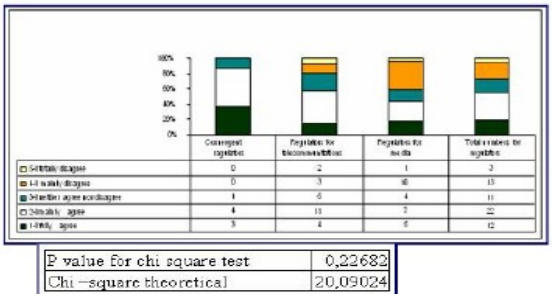

Figure 3. Influence of convergent regulator on implementation of technological neutrality

TABLE V: THE INFLUENCE ON DEVELOPMENT

Convergent form of organization of regulatory authority has more positive influence on development of telecommunications and broadcasting services than separate regulatory authorities for telecommunications and broadcasting	Convergent regulators	Regulators for telecommunications	Regulators for media	Total number of regulators
1	3	9	3	15
2	4	5	7	16
3	1	8	7	16
4	0	3	8	11
5	0	1	2	3
Total	8	26	27	61

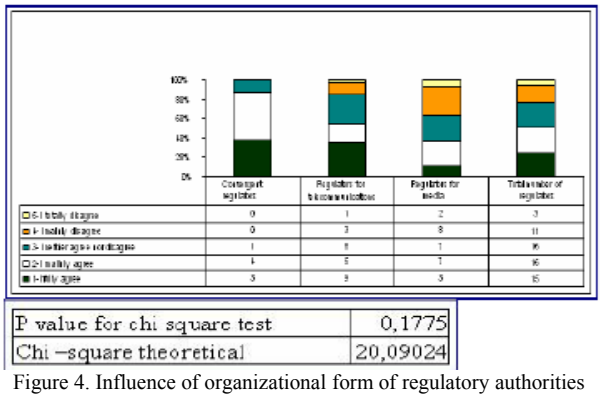

Figure 4. Influence of organizational form of regulatory authorities on development of telecommunications and broadcasting

Table 5 gives an overview of results of the interview with European regulatory authorities based on the question whether a convergent form of a regulator has more positive influence on the development of broadcasting and telecommunication services than separate authorities. Out of 61 stated opinions of regulators, 31 assessed that a convergent form has a more positive influence, 16 viewed that its influence is neutral, whereas 14 evaluated that it does not have any more positive influence on development of telecommunication and broadcasting than separate regulatory authorities. It is obvious that the weight is on the side of convergent regulatory authorities in comparison to the separate ones.

Since p value of chi-square test of equivalence of proportion is higher than 0.01, we conclude that, according to the given rank, for the question or attitude «a convergent form of a regulator has a more positive influence on the development of broadcasting and telecommunication services than separate authorities» there is no significant difference among the observed groups, i.e., there is a dispersion of the given ranks on this attitude for all types of regulatory authorities.

Figure 4 presents a graphical overview of the expressed attitudes of regulatory authorities in percentage. Convergent regulators and regulators for telecommunications assess in over 50% the influence of convergent regulators more positive than the separate ones, while in case of media regulators this percent is somewhat lower, but the attitude that a convergent regulator has more positive influence is still slightly prevalent.

On the grounds of a conducted analysis, a conclusion can be drawn that the hypothesis that convergent regulatory authorities ensure better quality implementation of the principle of technological neutrality than the separate authorities has been proven.

(1) convergent form of communication market regulatory authorities improves competitiveness of a country.

(2) unlike the separate regulatory authorities, a convergent regulatory body is a more appropriate model for ensuring development of the communication market at the territory of a country.

(3) the organizational form affects the capacity of a regulator to implement the European directives in the telecommunication sector.

V. CONCLUSION

One of the main features of convergent regulation is the institutional simplicity of implementing technologically neutral regulations. The need for technologically neutral regulation lies in the fact that companies providing similar services or using similar technologies face different regulation in their service provision, thus taking up a less favorable competitive position. The principle of technological neutrality becomes markedly critical in the context of regulating the NGN networks. Regulators all over environment for promoting development and implementation of the NGN networks as an important element of communication market development [10].

All this has prompted governments across the world to consider options of merging regulatory authorities for broadcasting and telecommunications. It is very important for all governments to carefully consider the issue of establishing their regulatory authorities. In order to do this, it to the primary task is to precisely and legally formulate a set of duties these authorities would have within the scope of their competences, the power of authorities they can practice in their work, and their legal and institutional relations with other state institutions. Under such circumstances, institutional convergence, implying convergence or merging of institutions, makes for one of the most logical solutions.

 ISBN: 978-1-61208-166-3

REFERENCES

[1] Baldwin, R.et al.: "A Reader on Regulation", Oxford, Oxford University Press p. 3, (1998):

[2] Bezzina J. & Sanchez, B.: „Technological convergence and regulation, Challenges facing developing countries", The Economic Journal on Telecom, IT and Media Communications & Strategies (special issue), November 2005, Tunis, p. 19, (2005)

[3] Brown, A. C., et al.: „Handbook for Evaluating Infrastructure Regulatory Systems", The World Bank, Washington DC, USA, p. 5, (2006)

[4] Castells, M.:" Informacijsko doba Ekonomija, društvo i kultura, Uspon umreženog društva (Information age – Economy, society and culture, The Rise of network society)", Golden marketing Zagreb, Croatia, p. 99, (1998)

[5] Dutta, S. and Mia, I.: „The Global Information Technology Report 2006-2007, Connecting to the Networked Economy", World Economic Forum & INSEAD, Geneva, p. 10, (2007)

[6] European Commission: Green Paper on the Convergence of the Telecommunications, Media and Information Technology Sectors, and the Implications for Regulation Towards an Information Society Approach, Brussels, (1997)

[7] Gates, B.: „Adoption-and prosperity-trough public-private partnership, article in Publication", Connect- World, London, UK, Global issue 2008, p. 16, (2008)

[8] Haqqani, A.B.: „The Role of Information and Communication technologies in Global Development Analyses and Policy Recommendations", - ICT Task Force Series 3, United Nations, New York, p. 95, (2003)

[9] Hudson, H.E.: „Global Connections, International Telecommunications Infrastructure and Policy", Wiley, New York, p. 1, (1997)

[10] International Telecommunication Union – ITU : "Trends in Telecommunications Reform, Convergence and Regulation", Geneva, p. 8, (1999)

[11] International Telecommunication Union – ITU: "Trends in Telecommunication Reform 2002-Effective Regulation, Geneva, p. 42, (2002)

[12] International Telecommunication Union – ITU: "Measuring the Information Society, The ICT Development Index", Geneva, p. 32, (2009)

[13] Jenkins, H.: "Convergence Culture", Where Old and New Media Collide, New York University Press, New York and London, p. 2, (2006)

[14] Jordana, J., Levi and Faur, D.: "The Politics of Regulation, Institutions and Regulatory Reforms for the Age of Governance", p. 1, (2004)

[15] Kukić, S. and Markić, B.: „Metodologija društvenih znanosti – metode, tehnike, postupci i instrumenti znanstvenoistraživačkog rada (Methodology of social sciences – methods, procedures and instruments of science and research papers)", Ekonomski fakultet Sveučilišta u Mostaru, p. 192, (2006)

[16] Lagumdžija, Z.: „Kompetitivnost Bosne I Hercegovine i regiona Jugoistočne Evrope 2007-2008" (Competitiveness of BiH and region of South East Europe 2007-08), Regionalni ekonomski forum Jugoistočne Evrope i MIT Centar za menadžment i informacione tehnologije, Ekonomski fakultet Univerziteta u Sarajevu, p. 18, (2007)

[17] Lagumdžija, Z.: „Komptetitivnost zemalja i regiona Jugoistočne Evrope 2008-2009 (Competitiveness of BiH and region of South East Europe 2008-09)" Regionalni ekonomski forum Jugoistočne Evrope i MIT Cetar za menadžment i informacione tehnologije, Ekonomski fakultet Univerziteta u Sarajevu, p. 13, (2008)

[18] Michalis, M.: "Governing European communications, from unification to co-ordination", Lexington, Lanham, USA, p. 193, (2007)

[19] Porter, M. E.: "The Competitive Advantage of Nations", First Free Press Edition, New York, USA, p. 1, (1990)

[20] Porter, M.E.: "Konkurentska prednost: ostvarivanje i očuvanje vrhunskih poslovnih rezultata (The competitive Advantage and Presearving of Top Businesss Results)", Asee, Novi Sad, 2007, p. 176, (2007)

[21] Richards, E. et al.: „The International Communications Market 2008", OFCOM, London, p. 166, (2008)

[22] Serentschy, G.: „Regulation in the Light of Convergence", the Twenty Sixth Symposium on Novel Technologies in Postal and Telecommunication Traffic (PosTel), Slide2, Belgrade, (2008)

[23] Stanford Encyclopedia of Philosophy: "Globalization, The Metaphysics Research Lab, Stanford", California, p. 4, (2006)

[24] The World Bank : „Information and Communications for Development", Extending Reach and Increasing Impact 2009, Washington DC, USA, p. 19, (2009)

[25] World Economic Forum: „The Global Competitiveness Report 2005-2006", Davos www.weforum.org/en/ [Accessed 27/04/2009], (2006)

 ISBN: 978-1-61208-166-3